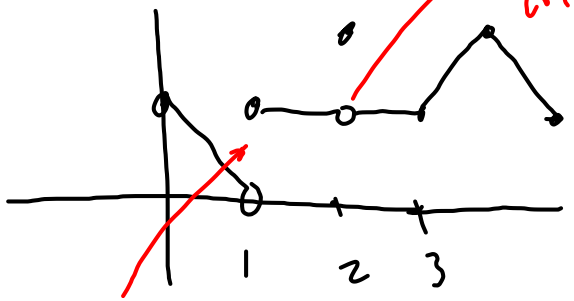
2.3 continuity



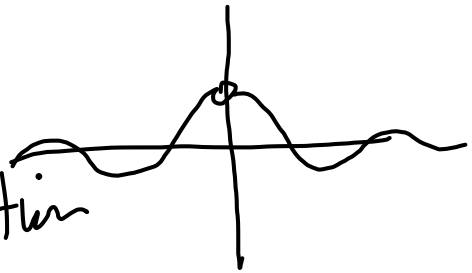
discont. at $x=1$

$x=2$

$y=\frac{\sin x}{x}$ discont. at $x=0$

remove discont.

extend the function



$$y=\begin{cases}\frac{\sin x}{x} & \text{if } x\neq 0\\ k=1 & \text{if } x=0\end{cases}$$

what should k equal

extend the definition of $y = \frac{x^2-4}{x-2}$ to make it continuous.

find the hole

disc at $x=2$

$x = 2$

$y = ?\ 4$

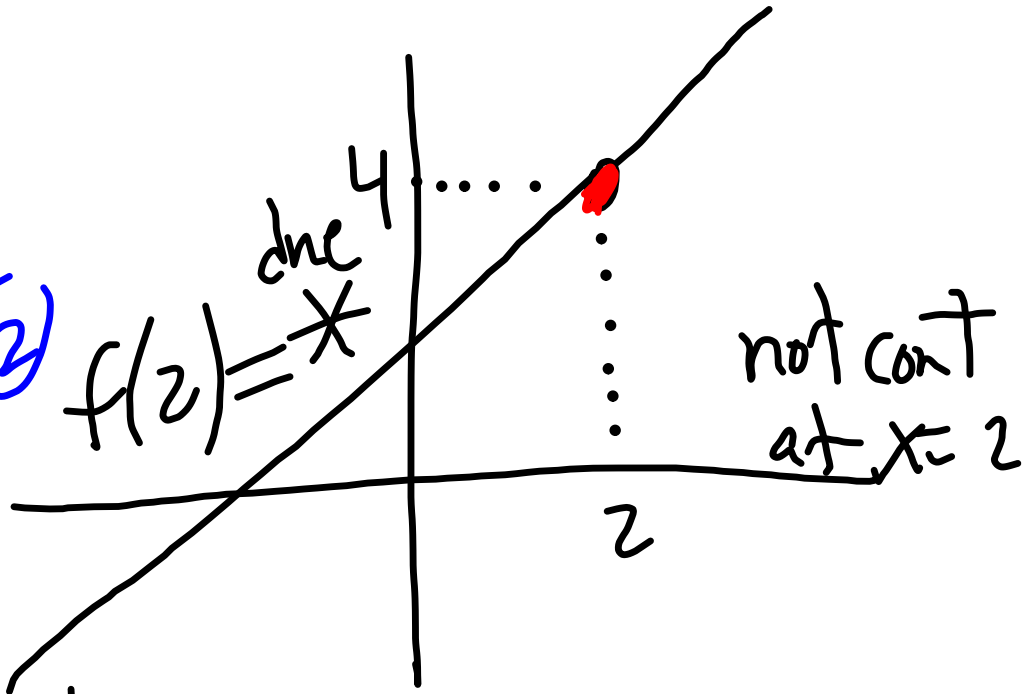
$$\lim_{x\to 2} \frac{x^2-4}{x-2} = \frac{(x+2)(x-2)}{x-2} = 4$$

$$f(x) = \begin{cases} \frac{x^2-4}{x-2} & x \neq 2 \\ 4 & x = 2 \end{cases}$$

$$f(x) = y = \frac{x^2-4}{x-2}$$

(1) $\lim_{x \to 2} \frac{x^2-4}{x-2} = 4$

(2) $f(2) =$ dne $= *$



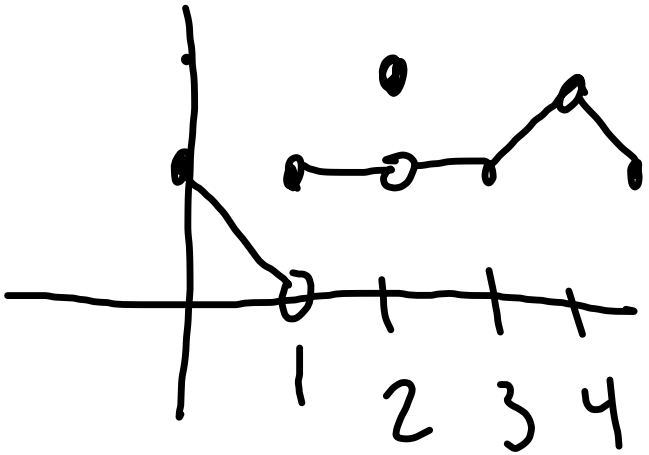
$$f(x) = \begin{cases} \frac{x^2-4}{x-2} & x \neq 2 \\ 4 & x = 2 \end{cases}$$

is cont at $x=2$

p 79 def. continuity at a point

$f(x)$ is continuous at $x = c$

if $\lim_{x \to c} f(x) = f(c)$ (1) (3) (2)



$\lim_{x \to 2} f(x) = 1$

$f(2) = 2$ $\neq$

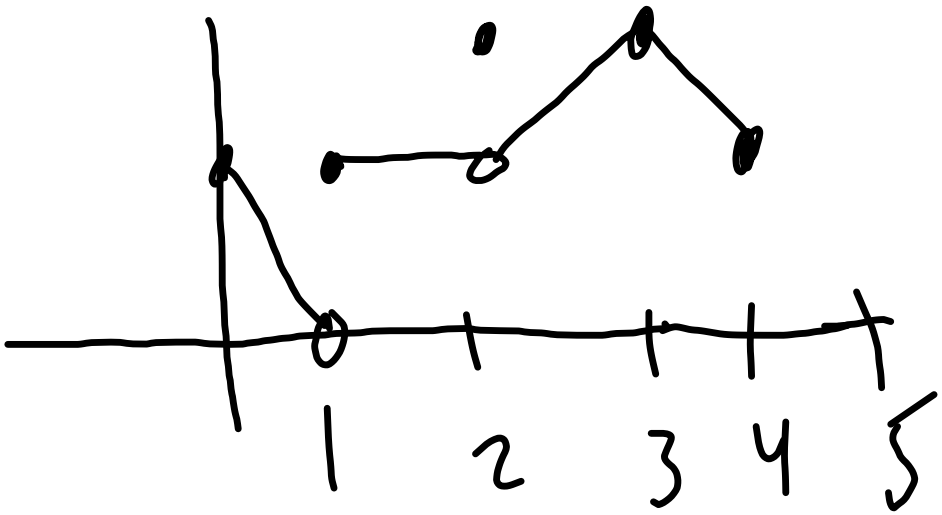
not cont.

show $y = \frac{x^2-4}{x-2}$ is cont at $x=1$

1. $\lim_{x \to 1} \frac{x^2-4}{x-2} = \frac{-3}{-1} = 3$

2. $f(1) = 3$ } same

3. same.

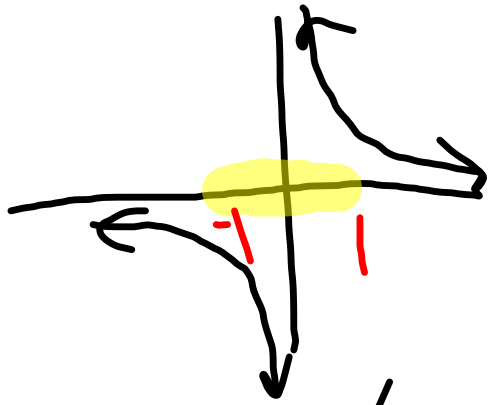


on what interval is f cont?

$[0,1) \cup (1,2) \cup (2,4]$

$(2,3] \cup [3,4]$

$y = \frac{1}{x}$



y is cont on $(-1, 1)$?